

WHAT IS CLAIMED IS:

1
1 1. An active electrode, comprising:
2 an active electrode filament and an active electrode head located at
3 the distal end of the active electrode filament, the active electrode head comprising a
4 coil of wire, the coil comprising from about 0.5 to 1.5 turns of the wire, the distal
5 end of the wire defining a dividing portion, and the dividing portion located within
6 the coil.

7
1 2. The active electrode of claim 1, wherein the dividing portion
2 bisects the coil to form a first void and a second void within the coil.
3

1 3. The active electrode of claim 2, wherein the first void and the
2 second void are adapted for retaining a liquid therein.
3

1 4. The active electrode of claim 1, wherein the dividing portion
2 is arranged at an angle of about 45° to the longitudinal axis of the active electrode
3 filament.
4

1 5. The active electrode of claim 1, wherein the wire comprises a
2 material selected from the group consisting of molybdenum, platinum, tungsten,
3 palladium, iridium, titanium, and their alloys.
4

1 6. The active electrode of claim 1, wherein the wire has a
2 diameter in the range of from about 0.006 inch to 0.020 inch.
3

1 7. A return electrode, comprising:
2 a return electrode filament and a return electrode head located at the
3 distal end of the return electrode filament, the return electrode head comprising a
4 coil of wire, the coil comprising from about 3 to 10 turns.
5

2 d) during said step c) translating the active electrode coil in the plane
3 of the active electrode coil with respect to the target tissue, wherein the target tissue
4 is severed.

1 15. The method of claim 13, further comprising:

2 e) during said step c), translating the active electrode coil in a
3 direction orthogonal to the plane of the active electrode coil, wherein the target
4 tissue is volumetrically removed.

1 16. The method of claim 13, further comprising:

2 f) during said step c), engaging at least one side of the active
3 electrode coil against the target tissue, wherein the target tissue is coagulated.

1 17. The method of claim 12, wherein the active electrode
2 comprises a hook, a coil, or a disc.

1 18. The method of claim 12, further comprising:

2 g) prior to said step c), delivering an electrically conductive fluid to
3 the return electrode coil.

1 19. The method of claim 18, wherein the probe includes a shaft
2 having a shaft distal end, the electrically conductive fluid delivered axially from the
3 shaft distal end via a fluid delivery port.

1 20. The method of claim 19, wherein the electrically conductive
2 fluid is delivered against interior and exterior surfaces of the return electrode coil.

1 21. The method of claim 12, further comprising:

2 h) aspirating unwanted materials from the surgical site via an
3 aspiration lumen.

1 22. The method of claim 12, wherein the high frequency voltage
2 applied in said step c) is in the range of from about 10 volts RMS to 500 volts RMS.
3

1 23. The method of claim 12, wherein during said step c) the
2 target tissue is exposed to a temperature in the range of from about 40° C to 90° C.
3

1 24. The method of claim 12, wherein the probe includes a shaft,
2 the shaft comprising a multi-lumen tube having a plurality of lumens therein.
3

1 25. The method of claim 24, wherein the plurality of lumens
2 include a first lumen and a second lumen, and the return electrode and the active
3 electrode are arranged in the first lumen and the second lumen, respectively.
4

1 26. The method of claim 24, wherein the multi-lumen tube
2 comprises a polyurethane elastomer extrusion.
3

1 27. A method of modifying a tissue at a target site of a patient,
2 comprising:

3 a) providing an electrosurgical probe including a return electrode and
4 an active electrode, the active electrode comprising a substantially flat active
5 electrode head adapted for severing tissue via molecular dissociation of components
6 of the tissue, the active electrode head including a dividing portion, the active
7 electrode head having at least one void therein;

8 b) positioning the active electrode head in at least close proximity to
9 the tissue at the target site; and

10 c) applying a high frequency voltage between the active electrode and
11 the return electrode, the high frequency voltage sufficient to ablate or modify at
12 least a portion of the tissue at the target site.
13

1 28. The method of claim 27, wherein the active electrode head
2 comprises an active electrode coil having from about 0.5 to 1.5 turns.
3

1 29. The method of claim 28, wherein the active electrode coil has
2 a diameter in the range of from about 0.050 inch to 0.200 inch, and a width in the
3 range of from about 0.003 inch to about 0.012 inch.
4

1 30. The method of claim 27, wherein the return electrode
2 comprises a return electrode coil having from about 3 to about 10 turns.
3

1 31. The method of claim 27, wherein said step c) effects localized
2 molecular dissociation of tissue components at the target site.
3

1 32. The method of claim 27, further comprising:
2 d) during said step c), reciprocating the active electrode head in the
3 plane of the active electrode head with respect to the tissue, wherein the tissue is
4 severed by localized molecular dissociation of tissue components.
5

1 33. The method of claim 27, further comprising:
2 e) during said step c), engaging at least one side of the active
3 electrode head against a severed tissue, whereby the severed tissue is coagulated.
4

1 34. An electrosurgical probe, comprising:
2 a shaft having a shaft proximal end portion and a shaft distal end
3 portion; and
4 an electrode assembly disposed on the shaft distal end portion, the
5 electrode assembly comprising a return electrode and an active electrode, wherein
6 the return electrode comprises a distal return electrode head having an open
7 structure whereby the return electrode head allows the passage of an electrically
8 conductive fluid therethrough.
9

1 35. The probe of claim 34, wherein the return electrode head has
2 an internal void therethrough, and wherein the active electrode passes within the
3 internal void.

1 36. The probe of claim 34, wherein the return electrode head is
2 adapted for retaining an electrically conductive fluid thereon.

1 37. The probe of claim 36, wherein the electrically conductive
2 fluid is retained on a surface of the return electrode head via surface tension.

1 38. The probe of claim 34, wherein the return electrode head
2 comprises a coil of wire.

1 39. The probe of claim 34, wherein the return electrode head
2 comprises a return electrode coil having up to about 50 turns.

1 40. The probe of claim 34, wherein the active electrode comprises
2 a distal active electrode head having at least one void therein.

1 41. The probe of claim 40, wherein the active electrode head is
2 adapted for retaining an electrically conductive fluid within the at least one void.

1 42. The probe of claim 34, wherein the active electrode head
2 comprises a metal disc or a flattened coil.

1 43. The probe of claim 34, wherein the active electrode head
2 comprises an active electrode coil having from about 0.5 to 1.5 turns.

1 44. An electrosurgical probe, comprising:
2 a shaft having a shaft proximal end portion and a shaft distal end
3 portion; and

an electrode assembly at the shaft distal end portion, the electrode assembly comprising an active electrode and a return electrode, wherein the return electrode comprises a return electrode filament and a return electrode head located at the distal end of the return electrode filament, the return electrode filament coupled directly to the connection block, wherein the return electrode conducts electric current from the return electrode head to the connection block as a single component.

45. A return electrode for an electrosurgical probe, comprising: a return electrode filament and a return electrode head disposed at the distal end of the return electrode filament, the return electrode head having an internal void therein, and the return electrode head allowing the passage of a fluid therethrough.

46. The return electrode of claim 45, wherein the return electrode head comprises a return electrode coil having from about 1 to 50 turns.

47. The return electrode of claim 45, wherein the return electrode head is adapted for retaining an electrically conductive fluid thereon.

48. The return electrode of claim 47, wherein the electrically conductive fluid is retained on a surface of the return electrode head via surface tension.

49. The return electrode of claim 45, wherein the return electrode filament is adapted for coupling directly to a connection block.

50. An electrosurgical probe, comprising:
a shaft having a shaft proximal end portion and a shaft distal end portion; and

4 an electrode assembly at the shaft distal end portion, the electrode
5 assembly comprising an active electrode and a return electrode, the return electrode
6 including a return electrode filament and a return electrode head, wherein the return
7 electrode head is formed by winding a distal end of the return electrode filament
8 into a coil.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2
--	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	---